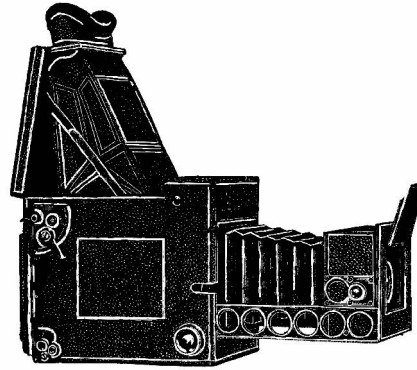


GRAFLEX HISTORIC QUARTERLY



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Development, Dominance, Decline and Disappearance of the Large Press Camera - The 4x5 Graphic

Part 3

By T.T. Holden

At the same time as GIs were returning from WWII and wanting to enter photography, Graflex was at work on still another upgrading of the Graphic, and in 1947 introduced the Pacemaker line of Graphic cameras. The familiar Speed Graphic had an improved focal plane shutter, which was synchronized for use with the long peak flash lamps. Most notably, the Pacemaker line included a model without the focal plane shutter for those not needing the high-speed shutter capability. This was called the Crown Graphic, although even today, it is referred to as "Speed Graphic."

Both models were made in the 2¼x3¼, 3¼x4¼ and 4x5 sizes. The 2¼x3¼ size was again quite popular with the advanced amateur, but the 3¼x4¼ size, previously popular with that group, had virtually no appeal. Indeed, many returning GIs were surprised to learn that there was any size other than 4x5.

The Pacemaker line of cameras proved to be immediately popular, and some newspapers began to use the Crown Graphic, since the front shutters could be used with flash, including the newly developed electronic flash for high-speed pictures. Many front

shutters were now made without the gear train delay required by flash lamps and were fitted with contacts for firing the flash only at the instant the shutter blades reached the full open position, since electronic flash has no delay. The letter "X" identified these shutters.

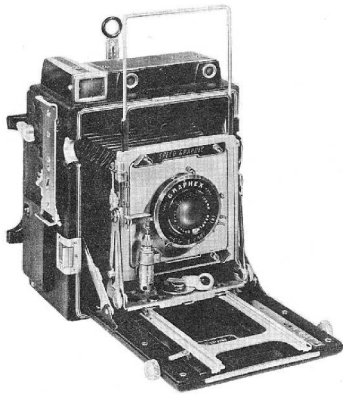
With the advent of the Korean War in the early 1950s, a few intrepid photographers stationed there learned about and decided to try some new Japanese 35mm cameras and lenses as fast as f/1.5. Film emulsions were now finer grained, and improved enlargers had appeared so that good enlargements could be made from the smaller negatives, if due care in developing and printing was observed. The excellent pre-war German Leica and Contax cameras had previously not been accepted by the ranks of the working professional photographers. The Korean War photographers were not under extreme deadline constraints, and many began using the smaller cameras as a matter of convenience. These photographers began the practice of making many shots of an event, selecting from the series the best one for publication.

During the late 1950s and early 1960s, the importers of Japanese cameras, principally Nikon, engaged in some very successful marketing programs, and many newspapers were persuaded to switch from 4x5 to 35mm. Of course, the smaller cameras were popular with other photographers, too, and Graflex entered the field with its own models, designed for the non-professional market. Despite the advantages of faster lenses and a smaller camera to handle, many news photographers were unwilling to switch to 35mm film, over and above the necessity of learning entirely new operating techniques. Each individual sheet of film could still be given special processing as needed, a procedure not possible with 35mm or 120-roll film. Also, the larger negative required less enlargement (for "contact print quality"). It could also be more easily "wet printed" to meet early deadlines. Wet printing is the term given to

putting a negative into an enlarger while it is still wet, right out of the hypo. An unstated reason for the use of individual 4x5 films doubtless was also due to the fact that a sloppy workman could handle the negative with his fingers on the sides or corners and get away with it, not at all possible with smaller negatives.

In 1955 Graflex introduced its own coupled range finder located across the top of the camera, allowing the use of interchangeable cams matched to each of the lenses used on the camera.

In 1958 Graflex attempted to increase interest in the 4x5 size by introducing the Super Graphic, which was intended to answer some requests for specific features. It had an all-metal aluminum body, a revolving back and a built-in electrical system allowing tripping the shutter from both sides of the camera. It had no focal plane shutter, but did have extensive front movements, such as lateral shift and lensboard tilt. However, it was a little heavier, cost more than the Crown Graphic, and since the death



knell of the 4x5 size for popular use had already been sounded, it was discontinued in 1973. The Super Speed Graphic, introduced in 1959, with a 1/1000 sec. shutter, was discontinued in 1969.

From time-to-time, special press cameras were made. These include the Ringside, the Big Bertha and the Graphic "45." The Ringside camera was essentially a 4x5 Speed Graphic camera body, without a front bed or bellows. It was fitted with a 135mm or preferably 165mm Ernemann f/1.5 lens in focusing mount. This permitted taking pictures at ringside where lighting was not yet good enough for regular photography, and flash was not permitted. Since the availability of these lenses was limited and the covering power not all that good, the customer had to supply the lens, and Graflex did the fitting. The Big Bertha Graflex, developed by Joe Sprague, an ex-news photographer, was built around the body of the 5x7 R.B. Home Portrait camera, with its special selection of focal plane shutter speeds.

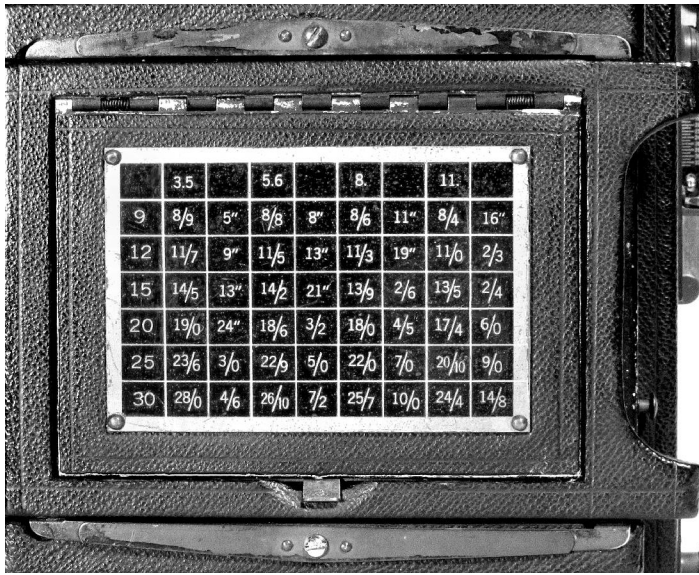
These cameras were usually fitted with 40" f/8 Dallmeyer telephoto lenses, and other lenses were used as requested. These big cameras were fitted with a special bed supporting the camera body and the lens, which were on a movable cradle. Focusing was accomplished by a "gear shift" lever, and adjustable stops were fitted, allowing quick setting of the lens for any predetermined distance, such as the bases on a baseball diamond. Such cameras were used by the wire service agencies, as well as major metropolitan newspapers. In later years, these cameras were made by other sources, all using 5x7 R.B. Home Portrait Graflex camera bodies with special shutter curtains to provide desired speeds.

The Combat Graphic or Graphic "45" was a camera developed in 1944 for the Armed Forces and was a bellows-less Speed Graphic with a front cone fitted with a Kodak Anastigmat Special lens in focusing mount and attached synchronizer for the 5ms delay SM flash lamps. Few of these went to civilian orders, although some found their way there.

From the mid-1960s, the use of the 4x5 Speed Graphic for news photography declined markedly. The 4x5 Crown Graphic cameras held their own until the early 1970s when professional processing labs began to accept 35mm and 120-roll film. In 1973 the last production lot of 4x5 Crown Graphic cameras was made, and at the end of the year, all manufacture of photographic products was discontinued.

Production of products for the audio-visual field continued, since the appearance of the Russian Sputnik gave great impetus to audio-visual training. This line had been acquired by Graflex in 1956, when General Precision Equipment Co., which already owned SVE and Ampro, assumed full control of Graflex. Consequently, Graflex suddenly became the producer and distributor of the well-known and highly respected SVE Schoolmaster film strip and slide projectors, as well as the Ampro 16mm sound projectors. General Precision was in turn purchased by The Singer Co., which sold it as Singer Educational Systems to Telex. Telex began to shift production to Minneapolis, and by March of 1985 (about 100 years after W.F. Folmer's first interest in photography), nothing was left of Graflex in Rochester. The name "Graflex" was unfortunately sold to another firm, and there has been some attempt to use it on some small inexpensive cameras made in the Far East. There is no word about such an item being placed on the American market.

There still exists some need for the 4x5 Graphic cameras, but this can usually be met by availability of cameras in good shape offered through numerous camera fairs, usually by photo historical societies and through advertising in publications such as [CameraShopper](#) and internet auctions like eBay.



...the Case of the Tricky Table

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While I cringe at the title of expert, I've used a Graphic of some sort for twenty years and have been sleuthing answers to hard questions on the Graflex.org help board website for going on 8 years. I will reluctantly admit that I know more about Speed Graphic cameras than any sane person should. As it usually happens when somebody thinks they know a lot about a small subject, the idea of writing a book inevitably comes to mind.

It was through this excuse that I managed to get myself on the doorstep of our editor's house. Ken had several cameras that I couldn't get my hands on, and I needed to photograph them for this book that I claim to be writing.

While I was photographing his collection of Combat, Top Handle and factory modified Pre-Anniversary cameras, he handed me a 1938 4x5 Pre-Ann with an unusual table on the back. The camera was factory fitted with a revolving 3x4 back; the table was riveted to the ground glass cover. It was made of brass and was very large, nearly filling the cover. The numbers were in relief with the background painted black, much like the Shutter Speed Table on the side. It was hard to tell if this was factory made or if the first owner had a penchant for spending money.

Ken asked me to take a look at it, as he hadn't

quite figured out what it was for, but thought it might be for copy work. This was a case I felt up for, as most charts on cameras were simple enough.

The chart was filled with odd fractions. The few entries, clearly marked in inches, only added to the confusion. Few other clues existed. The lens was a non-original, post-war Ektar, mounted on a machinist-made, all metal lensboard. The board might be as old as the camera, but we just didn't know. A Bakelite focus scale, clearly not meant for the post-war lens, resided quietly on the side of the bed.

It would take some serious thinking and, unfortunately, I was pressed for time. I bid Ken and his lovely wife, Dee, a reluctant goodbye and went on to my other obligations. While I had forgotten to photograph the camera, I hadn't forgotten about the table. Once back at home, I emailed Ken, asking if he would send me a photo of it so I could tackle this puzzle.

Looking at it again, there seemed to be no real order to it. Yes, the left column certainly looked like distances, and the top row was undoubtedly an aperture scale, but there were columns full of odd fractions, while other columns had both distances and fractions in them, and those columns didn't have headings at the top!

I asked Ken if he could measure the distance between infinity and the shortest distance on that old focus scale. I also asked if the numbers from the left column appeared on the scale. Scales are unique to a lens' focal length, and if the numbers matched, I'd be on to something, exactly what I wasn't sure of.

Ken's email came back the next day. It was a no go on the numbers, but the distance from the 5-foot mark to infinity was 1-1/8". Most scales are around 1/2" long. This was not a common Graphic lens. So I broke out my Kodak reference book, dusted off my slide rule and went to work. The lens was a 7-1/2". From the table, it had a speed of f3.5. There weren't too many companies making a 190mm f3.5 back in '38, and any of these lenses would be nearly as expensive as the camera. The original owner was no hack amateur, and the lensboard was not original.

While I had managed to get the camera to tell me what lens was on it, it still wasn't telling me what these frustrating fractions were for. I passed the photo around to some other photography friends. One gentleman thought it was a thread pitch chart for the bolts used on the Titanic, while oth-

ers politely did not reply. The last one, a photographer known for his macro and copy photography, stated boldly that the fractions were reduction ratios for copy work. I almost believed him, until I saw that many of these fractions had a zero denominator, which made reduction quite difficult. Also, I have yet to see a copy lens with a speed of f3.5. I know as much about reduction ratio tables as Butterfly McQueen did about childbirth, but this was no copy chart.

Reality knocked, in the form of my wife. She reminded me that I had promised for two years to build a new picket gate, and since I had been staring at a photo of a chart on my computer screen for half an hour, it was obvious I could start now. Caught off guard, I relented. Since all new projects start with a trip to Home Depot, I left.

It was there, lost between the replacement windows and the new doors that I found it. Stapled to the doors were cards listing the width of the doors: 3/0...36", 2/6...30". The gate would have to wait.

I raced home and pulled up the chart. YES! It works! The fractions are feet/over inches! The second column must be tied to the first. This means that for 9 feet @ f3.5 we have a range from 8 feet 9 inches down to 5". What kind of range is that? I looked at the longer distances. They seem to fit. As the distance increased, the range extended out farther from the camera.

But there were two very un-photographic trends to this charmed chart. The ranges began at less than the given distance, and the range decreased slightly as the f-number increased. I printed a copy of the chart so I could stare at it while I dried my daughter's hair and put her to bed. She's only 8, but already knew the score, "If you're gonna tell me one of your Graflex camera stories, I want Mommy to read to me tonight." My wife knew the score as well, she gave me "The Look" as I crept back downstairs to my office, and said, "I'm not waiting up for you."

As night settled in and the mound of soda cans began to grow, I realized something was amiss. I had ruled out Depth-of-Field charts, as they always show the near point and far point, the focus point being somewhere in between. Further, the range given for f3.5 is simply too large. 8'9" down to 5"??? The depth-of-field for a 190mm lens at f3.5 would be quite shallow. I also ruled out a flashbulb chart for several reasons, the least of which was as the lens was stopped down, the range did not decrease by whole or even half stops. I thought of tables used for casket sets, where you have three or four cells that can make up a multitude of focal lengths, but a Speed

Graphic can't handle a 30-inch or even a 30-centimeter cell, and they never made a casket set with a speed of f3.5. See page 8. I emailed some friends, always using the example "9 feet at f3.5 gives a range of 8'9" down to 5"."

One thing remained certain in my mind. This chart was large and easy to read. He used it on the fly, getting information from the chart instantly, without a lot of thinking and recalculating. But what information did he get, and what range would decrease as the f-number increased?

I concentrated on this last fact. As the depth-of-field increased, the range in front of the camera that was out of focus would decrease. Maybe this was a Depth of Fuzziness table?? But what about the short end of the range? Ignoring that, I found a depth-of-field calculator online. Plugged in the critical information, format: 4x5, lens: 190mm, aperture: f3.4, which was the closest they had to 3.5, then Calculate. Chills went up my spine. The number in the window next to "near limit of acceptable sharpness" was 8.79 feet. I grabbed my slide rule and multiplied .79 by 12. Answer: 9.4". The near point was 8 feet 9 inches. Exactly as the chart said. So what about this 5" number? My eyes glanced at the "far limit of acceptable sharpness": 9.22 feet. Very close indeed. I subtracted one from the other. Answer: 0.44 feet or 5 inches. It WAS a Depth-of-Field chart! I was reading it wrong. The range wasn't 8'9" DOWN TO 5", the range was 5 inches! The near point is 8'9"!

I ran several of the other numbers, and they aren't as close as the first, but I suspect if I were to use an older standard for the circle of confusion and a slightly worn slide rule instead of a super accurate computer, I could get closer. This style of DOF chart makes more sense with a long lens like a 190mm, than a near wide angle such as a 127mm or 135mm. After all, when I'm shooting something wide open, I'd certainly prefer to know the range of sharp focus over the far point. Who made it is still a mystery. It could have been Folmer Graflex, as they certainly had the talent to calculate the data and the process for making it, but why not add their name to it?

Graflex doesn't give up secrets easily.





The F & S Finger Print Camera

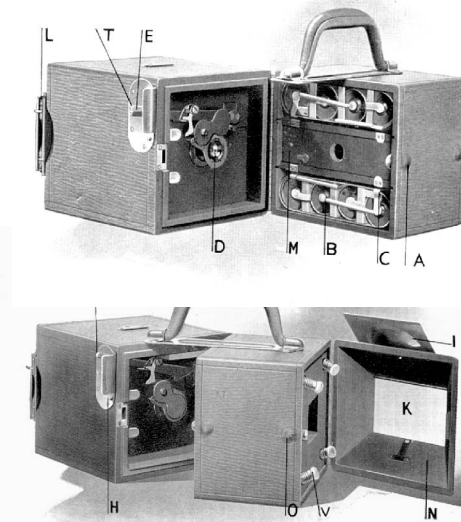
By Ken Metcalf

The earliest use of fingerprints for identification was in ancient Babylon and China. In 1897 India was the first country to use fingerprinting for the classification of criminal records. England followed in 1901.

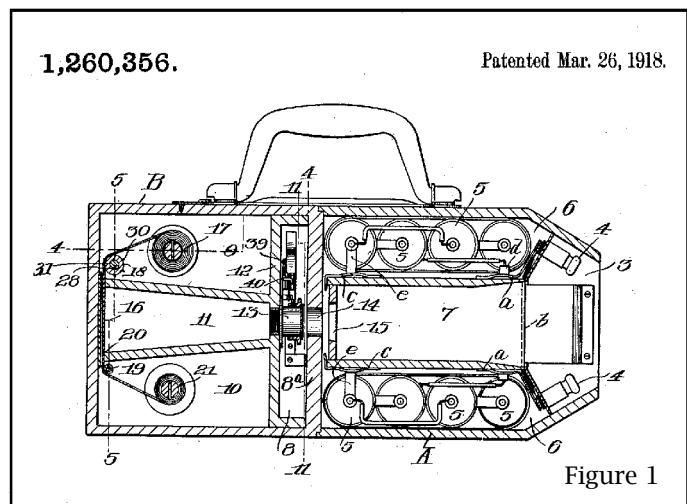
1902 saw the first systematic use of fingerprints in the United States by the New York Civil Service Commission, and in 1903 the New York State Prison system started using fingerprints for criminals. In 1904 the Leavenworth Federal Penitentiary and St. Louis Police Department started using fingerprints.

The U.S. Army began using fingerprints in 1905, followed by the Navy two years later, and the Marine Corp one year after that. For the next twenty-five years, law enforcement agencies began using fingerprints as a means of personal identification. Many of the agencies began sending copies of their fingerprint cards to the National Bureau of Criminal Identification, which was established by the U.S. Department of Justice. The Bureau was transferred to the Leavenworth Penitentiary, and in 1924, to the Federal Bureau of Investigation, forming the nucleus of their files.

On October 25, 1915, William F. Folmer, as assignor to the Eastman Kodak Company, applied for a patent for a "film camera," which was granted on March 26, 1918 (Patent number 1,260,356 - Figure 1). In this patent, the camera is shown with a roll film system using "film strips," and it was "...designed for photographically recording the readings of gas and electric meters..." Mr. Folmer applied for a second patent for "a photographic camera" on December 14, 1916. The second patent primarily added a mirror that reversed the image, allowing the use



of a direct positive "film" (paper) and not the original negative film, and was granted June 25, 1918 (Patent No. 1,270,280). In both patents, the silhouette of the camera and basic operation are similar to the well-known fingerprint camera. So you think you have read enough about patents, think again! Mr. Folmer actually had a patent granted earlier (1,139,022, patented May 11, 1915). Again, it is "...for making photographic records of the readings of gas meters..." Visually, this camera is snub nosed, rather than cone shaped.



When the F & S Finger Print Camera first appeared in a Graflex retail catalog in 1917 (although there is some evidence it may have been available as early as 1915), the roll film mechanism was gone, and it now sported a 2½x3¼ Graflex back, and was supplied with a Graflex Double Glass Plate Holder, but could also use a Magazine Plate Holder, roll holder, or film pack.

That said, what happened to the patented cameras of 1915 and 1918 versus the catalog camera of 1917? Theories abound. Here is the one I like. Of the patents issued between 1915 and 1918, for

cameras and shutters with features similar to the Finger Print Camera, Graflex simply changed the basic camera to meet market needs. This, I believe, is supported by the following “boiler plate” patent language: “... but such matters [of design], are incidental to the spirit of the invention concerned and can be modified according to the use to which the camera is to be put without departing from the main inventive idea.” Thus, a gas and water meter recording camera, a telephone meter recording camera (both called Factograph)(Figure 2), and a fingerprint camera evolved from these patents. Other opinions are welcome.

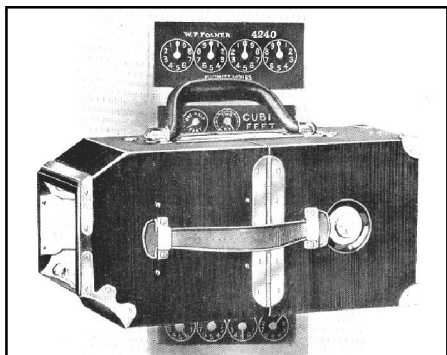


Figure 2 Meter Reading Factograph

Now, back to the camera of 1917. It had a 72mm f6.3 Kodak fixed focus Anastigmat lens for 1:1 photography. The camera could reproduce a full-size fingerprint with good definition. The camera could also be used to photograph “small patterns, signatures, formulas, labels, photographs, or portions of printed or written matter.” The camera has four battery powered, miniature lamps located behind the front aperture that light the fingerprint or other items. Camera dimensions are 11¾"x6"x6". Weight with batteries is 5 lbs. 5 oz., and it sold for \$30.00.

Although primarily designed to give instantaneous exposures, by simply holding the release lever at a line engraved on the camera, the shutter would remain open until the lever was moved further down. Also, the four lamps could be turned on with a separate button, thus allowing the camera to be used as a flashlight. Finally, six spare lamps could be stored in a drawer in the camera.

In 1935 the Folmer Graflex Corp. introduced the Graflex Inspectograph Camera (“An Electrophotographic Inspector”), which was like the F & S Finger Print Camera, except it operated on an electric line current instead of batteries, and the four lamps were equipped with “shields.” The camera came with an 8' detachable extension cord, and in a 1938 catalog, Graflex also sold a 25' extension cord for \$2.25. As suggested by the

name, the camera was targeting a wider market, which included “institutional records.” According to Tim Holden, the camera did not prove practical, as most subjects were too far from the source of electricity. He believes only one batch of these cameras was produced (78 cameras) and, therefore, are rare (Figure 3). This model lasted until 1940, while the F & S Finger Print Camera was discontinued in 1952, after a production run of approximately 2,000 cameras.

As a testament to Folmer’s design, the fingerprint camera was sold for thirty-five years without any design changes. According to Bill Inman, shortly before this camera was discontinued, two manufacturers duplicated it: F. J. Sirchie Co. and Burke and James, who manufactured the Watson-Holmes Fingerprint Camera. These cameras are no longer being manufactured, having succumbed to advanced methods.

Sources: Historical information on fingerprinting was supplied by Greg Moore’s fingerprint history page, [brawley online](#), and now on [onin.com](#), and Bill Inman provided information on the Graflex cameras.

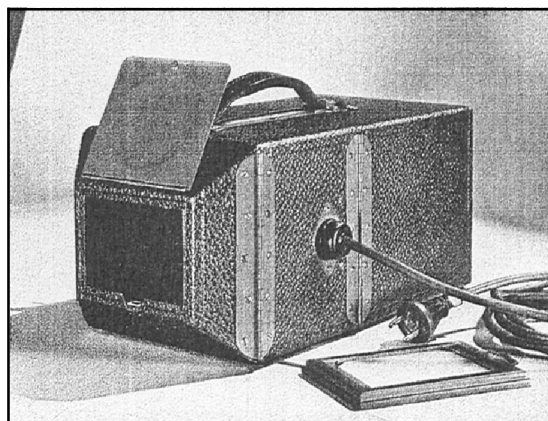


Figure 3 Inspectograph





Ask Tim Holden....

These comments on focusing are reprinted from various issues of the Graflex Trade Notes, contributed by Tim.

owners of Graphic cameras who are using their camera lenses in this way, it appears to be a completely satisfactory and workable arrangement.

Trade Notes January 1954

Focusing Scales Available

Many requests are received at Graflex for sets of vernier focusing scales to be used with a specified lens and camera. Although lenses are marked with a certain focal length, they may vary somewhat and still be within the tolerances allowed by American Standards Association. These differences, although slight, call for specially calibrated focusing scales which agree with the EXACT focal length of the lens to insure sharp negatives and perfect performance of your equipment. Because of this, we are in a position to supply engraved focusing scales only when we can have the lens to custom-fit a mating scale for it.

To facilitate your fitting scales on Pacemakers without sending your lens away, we can now supply three sets of scales on which we have engraved the numerical distances but *not the related focusing lines*. These sets of scales cover the range of *normal* focal length lenses used on our Graphics. After being attached to your camera, the lines can quite readily be scribed in the proper position.

For wide-angle or telephoto scales, we would recommend you send your lens to a Graflex Service Center (Rochester, Los Angeles, New York, Toronto) for a custom engraved scale. If preferred, a set of blank scales (without any engraving at all) can be ordered for Pacemaker, Anniversary or Miniature Graphics.

Trade Notes March 1950

Using a Rangefinder with More Than One Lens

The rangefinders used on the Graphic cameras are not readily field adjustable for use with different lenses. It is quite a simple matter to use a single rangefinder for focusing more than one lens.

An infinity position must be determined, and proper focusing scales must be prepared and properly fitted for the additional lens. The rangefinder should be left adjusted for the standard lens and used with the focusing scale for that lens for determining the distance to the subject. This means that the camera is to be focused in the normal manner and after the rangefinder has been adjusted by moving the focusing knob of the camera. The distance to the subject is read from the focusing scale for the standard lens. The reading from this scale is then transferred to the focusing scale for the additional lens and the track set accordingly.

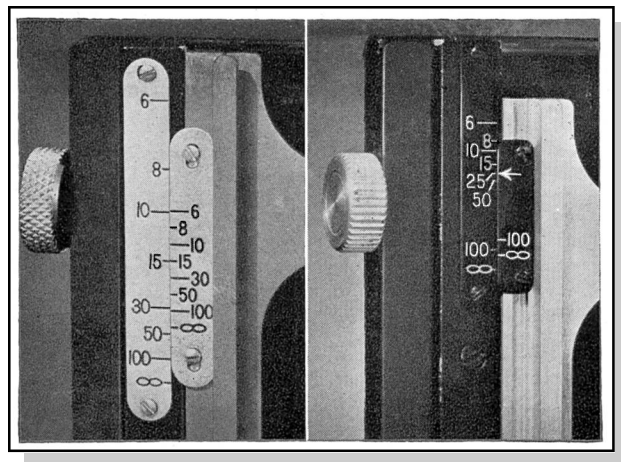
This, in effect, provides rangefinder focusing, although it is not synchronized rangefinder focusing. It can be done quickly and easily, and from reports of

Focusing with the Graphic Polaroid Back

When the Graphic Polaroid Back is fitted to a Graphic camera, the film plane is located about 1½ inches behind the normal film plane of the camera. This is the reason why the special spacer plate must be fitted behind the infinity stops and the front standard drawn out to it. A new design of spacer plate is being made so that it can be used not only with the Anniversary and Pacemaker Graphics, but also the Super Graphics. This is entirely satisfactory for normal photography of subjects at distances of 10', or greater, or even down to about 5' or 8'.

However, when photographing subjects closer than 5', the difference in distance between lens to rangefinder, and lens to Polaroid film plane, becomes significant. In such an instance when the rangefinder images are correctly aligned, accurate focus of the images on the film is still not achieved due to this difference in distance. Therefore, we prefer that at these closer distances for best results, the rangefinder and focusing scales not be used. For these distances and, of course, for copying purposes, it is then necessary to use the Polaroid focusing panel. Be sure to have this available for sale with the Graphic Polaroid Backs in the event that the customer plans to do any closeup photography. The new high speed films, and in particular the transparency films, will probably be used largely for closeup work, requiring the sale and use of the special focusing panel. By bringing this to the attention of your customers, you will permit them to use the Graphic Polaroid Back at once with complete satisfaction, instead of encountering difficulties which have to be solved at a later date.

Trade Notes October 1958



Vernier focusing scales. Left, earlier models; right, Pacemaker models.

Graflex Historic Quarterly

The Quarterly is dedicated to enriching the study of the Graflex company, its history, and products. It is published by and for hobbyists, and is not a for-profit publication. Other photographic groups may reprint material provided credit is given GHQ and the author. We would appreciate a copy of the reprint.

WANT AD POLICY:

Any subscriber wishing to place a want ad or seeking Graflex-related items may send them to the GHQ for inclusion at no charge (at this time). The editors reserve final publication decisions.

Cliff Scofield, photographer, author and camera repairman, recently passed away at 100 years of age. Cliff has been a long-time subscriber and contributor to the Quarterly. His latest book, The Super D Graflex, a Repair and User's Manual, was co-authored with Ed Romney, who passed away in 2003.

Cliff's enthusiasm, kindness and contributions to photography will be missed.

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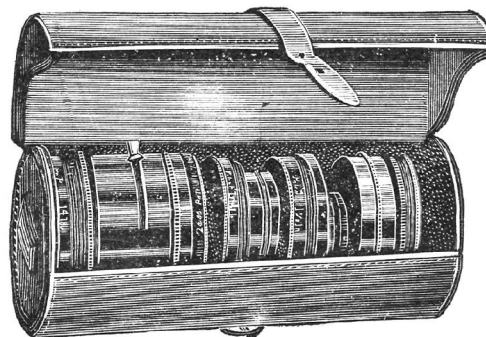
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